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54 **Apparatus for printing and dispensing labels.**

57 A label applicator for self-adhesive labels is disclosed.

The applicator includes cam tracks (42,44) which control the orientation of two pivotal print-heads (20,22) during motion from a rest position to a printing position. The print-heads are mounted on levers (28) pivoted in the casing so that motion of the print-heads takes place about two pivot centres (24, 26 and 29). A rotary inking roller (62,64) is positioned along the path of the operative facets (34) of each print-head and inking takes place during movement of the corresponding print-head (20,22) to ensure contact during one part of the cycle and avoid such contact during the return. The roller (62,64) acts as a part of the cam track (42,44). The inking action is such that the roller (62,64) is rotated by the operative facets (34). At the instant inking takes place, a part (46) of the cam track serves to prevent lateral motion of those print facets.

The invention can be applied to label applicators (or dispensers) wherever there is a need for high quality printing on labels.

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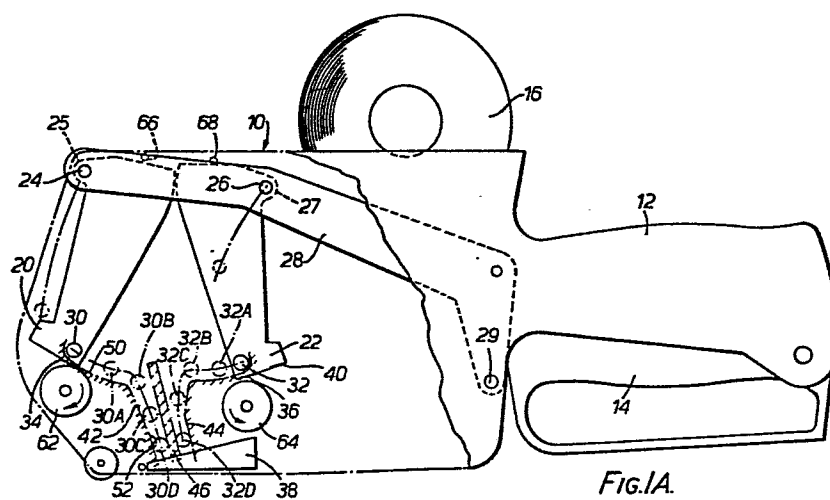


FIG. 1A.

APPARATUS FOR PRINTING AND DISPENSING LABELS

This invention relates to apparatus for printing and dispensing labels, for example hand-held apparatus for use with pricing labels.

Numerous apparatus are available for printing and dispensing labels and such apparatus incorporates one or more print heads which serve, prior to the dispensing of any given label, to apply indicia to that label. The indicia usually takes the form of a price and a stock code and experience has shown that it is very important that the indicia should be so printed on the label that legibility is good even under poor lighting conditions.

The simplest form of printing involves a stamp impression but it is also very well-known in general to use rotary printing for high speed production and controlled printing quality.

In hand-held, manually-operable, apparatus, the problem of providing satisfactory indicia on labels has involved some complexity and cost which is clearly undesirable. In one such proposal a print-head is made to pivot while a label being printed is being moved forwardly simultaneously and although this gives good results in practice, the apparatus is rather complex, the more so when two print-heads are incorporated in order to provide a two row printing facility. Furthermore, it is frequently desirable that the ink used for one row of printing should differ from that used in the other.

It follows that it is desirable that the print-heads should be operated by a simple mechanism but that nevertheless the quality of the printing should be consistently good and this necessitates that the operative print facets of the print-head or heads shall be adequately inked before each printing takes place.

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According to the present invention, there is provided, in apparatus for printing and dispensing labels, a print-head assembly having operative print facets, pivotal lever means mounting the said assembly, means pivotally mounting the print-head assembly on the pivotal lever means, means for actuating the lever means to bring the assembly to a printing station; and cam means, including a rotary inking roller assembly, operative to control pivotal and linear motion of the print head assembly over at least a part of the operating cycle of the apparatus while the pivotal lever means carry the print head assembly over an arcuate path centred on the pivot point of the lever means.

Hand-held label printing and dispensing apparatus embodying the invention will now be described, by way of example only, with reference to the accompanying diagrammatic drawings, in which:-

Figures 1A and 1B show the outline of an embodiment of apparatus in accordance with the invention with two print-head assemblies at a rest and a printing configuration;

Figure 3 is a side elevation of a modification in which the print-head assembly has provision for two lines of print in a single head; and

Figure 4 is a side elevation of a second modification of the print-head assembly of Figs. 1 and 2.

Referring now to Figs. 1A and 1B, the hand-held label printing and dispensing apparatus as a whole comprises a body 10 rigid with a handle 12 and at the end of the handle remote from the main part of the body a trigger member 14 is pivotally mounted which serves to actuate in any given operational cycle label feed and dispensing and also printing.

The label storage and dispensing means includes a

reel 16 of label web which incorporates both labels with a self-adhesive surface and a backing strip coated with silicone, and a wind-up reel 18 (Figs. 3 and 4) for the spent backing strip after the labels have been dispensed. The wind-up reel is not illustrated in Fig. 1.

The print-head assembly comprises two separate but co-operating print-heads 20,22, both of which are pivotally mounted at pivots 24 and 26 on a pair of pivotal arms 28 (only one shown in Fig. 1). The arms are shown in greater detail in Fig. 4 together with actuating means therefor and provide a pivot axis 29 external and additional to the pivots 24 and 26 of the heads themselves. The pivots 24 and 26 provide internal pivot axes within the bounds of the respective head, but off-set laterally with respect to a plane extending along the row of operative print facets and normal to the plane containing the operative print facets. As shown the pivots lie in lug 25,27 of the respective print-head end plates.

Each print-head assembly carries a spigot 30,32 at its end adjacent to the operative print facets 34,36 thereof and pivoting actuation of the arms 28 supporting the print-heads 20,22 controls, with the aid of the respective spigots 30,32, the movement and orientation of the heads both while inking is taking place and during their travel towards a printing platen 38 on which a label to be printed is present. One or both of the heads may also incorporate a cliché 40 which is not adjustable as are the operative print facets 34,36 which are mounted on print bands 41 (Fig. 2).

During movement of the print-heads under the action of the arms 28 the spigots 30,32 co-operate with respective cam tracks 42,44 and an intermediate track 46 lying between them which serves to prevent over-travel during the movement towards the printing platen 38. The cam track 42 includes a stop portion 48 corresponding to the rest position of the print-head 20, a concave inclined portion 50, and a rectilinear portion 52 extending normal

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to the working face of the platen 38. The cam track 44 has a stop portion 54 corresponding to the rest position of the head 22, a concave portion 56 extending generally at right angles to the rectilinear intermediate track 46, an inclined portion 58 and a rectilinear portion 60 extending normal to the working face of the platen 38. Inking rollers 62,64 co-operate with respective print-heads 20 and 22 and effectively act as control cams as they co-operate with the operative print facets 34,36.

The arms 28 are actuated by the trigger member 14 through means, not shown in Figs. 1A and 1B, and not forming part of the present invention. One possible mechanism is illustrated in outline in Fig. 4.

Operation of the trigger member 14 will cause the twin arms 28 to pivot from the position shown in Fig. 1A progressively to the position shown in Fig. 1B. During the first part of the operational cycle inking will take place and provided that an inking roller 62,64 is present, the spigots 30,32 do not contact the track portions 50,56 and the motions of the print heads are therefore controlled by interaction with the inking rollers 62,64 themselves. Excessive pressure by the heads on the rollers is prevented by an arrangement illustrated in and described hereinafter with reference to Fig. 2. The spigots 30,32 co-operate with the track portions 50,56 respectively in the absence of inking rollers in order to prevent damage to the mechanism. Spring means (not shown) lightly bias the heads to the open configuration of Fig. 1A. Continued movement of the support arms 28 results in the heads 20,22 disengaging from the inking rollers which have been rotated by contact with the operative print facets and the respective spigots 30,32 then move down the portions 52 and 58,60 of the cam tracks and any tendency to over-travel and thus interference between the two print-heads is prevented by the intermediate track 46 lying between the cam tracks 42 and 44. The rotary movement of the inking rollers 62,64 ensures that during each successive operation of the

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apparatus a different part of the ink pad periphery will be contacted, so that re-inking of the surface from the interior of the inking roller can take place ready for the next contact with the operative print facets. Locii of the spigots 30,32 are indicated in chain lines 30A,32A,30B,32B ... and so on in Fig. 1A.

At the printing position of the two heads as shown in Fig. 1B, the spigots 30,32 are closely confined by the cam tracks 42,44 and the intermediate track so that lateral movement relative to the label on the platen 38 is positively prevented.

The return half of the operational cycle is substantially the same as the first half but the operative facets do not contact their respective ink rollers 62,64 on the return half of the cycle. This is ensured because the upwards (as shown) movement of the arms 28 does not press the operative print facets towards the inking rollers 62,64 and reset stops 66,68 provided adjacent the upper edge of each print head in its rest position are not contacted until movement of the arms 28 has been substantially completed. In other words, while the arms 28 push the operative print facets up towards the ink rollers during the first part of the operational cycle, upwards movement is effected without any such constraint so no contact occurs. Thus undesired ink transfer during the operational cycle is prevented and in the rest position the operative print facets do not contact the inking rollers 62,64.

Figure 2 shows an end view of one print-head 20 or 22 and the corresponding inking roller 62 or 64 and the pair of pivotal arms 28 which support both print-heads. For the purpose of renewal of the inking rollers 62,64, they may be readily removable by mounting a spindle 70 of the roller in a bearing 72 integral with one wall of the casing 10 and a second spindle 74 in a knob 76 which is a snap-fit in another wall of the casing 10. As will also be apparent from Fig. 2, end plates 80 of the print-head

engage during the first part of the operational cycle against corresponding flanges 82 at each end of the inking roller 62 or 64 and this engagement ensures that during the inking operation the operative print facets 34 do not dig too deeply into the spongy rubber material forming the outer face of the inking roller 62 or 64. The inking roller is readily removable and replaceable by axial movement, indicated by double-headed arrow 63.

Turning now to the modification illustrated in Fig. 3, the apparatus as a whole is generally similar to that of the first embodiment illustrated in Figs. 1 and 2 but the print-heads are coupled and mounted about a single pivot 100; a single spigot 102 co-operates with a single cam track 104 to control movement of the print-head both in relation to the single inking roller 106 and in relation to the printing platen 108. As in the first embodiment, the inking roller itself acts as a cam or guide for the print-heads unless the inking roller is absent. The cam track 104 includes an end stop 110, a portion 112 corresponding to the inking part of the operational cycle, a portion 114 inclined in relation to the printing platen surface and a portion 116 normal to the platen surface. A second track 118 serves the same purpose as the intermediate track 46 of the first embodiment, namely to ensure freedom from lateral movement of the print-head at the instant of printing (chain lines). Spring means (not shown) bias the heads to the full line position. In this embodiment, the inking roller can be removed in the direction of the arrow E or alternatively as indicated in the embodiment of Figs. 1 and 2. The roller removal arrangement of Fig. 3 can also be applied to the embodiments of Figs. 1 and 2.

The manner of operation of the embodiment of Fig 3 is generally similar to that of Figs. 1 and 2 except that only one head assembly is moved. Two line printing is again possible but may not provide as high quality as the first embodiment since any slight misalignment of the single pivotal assembly cannot be as readily accommodated.

In the embodiment of Fig. 4 the single print head 120 is arranged to co-operate by means of a spigot with a single cam track 104 as in the embodiment of Fig. 3. The print-head 120 provides only a single line of print but otherwise the construction of the printing mechanism is generally the same as that of the embodiment of Fig. 3 and like parts have been given the same reference numerals. In the operational cycle the retraction of the print-head 120 effected by the spring means 122 causes, as in the first embodiment, the operative print facets to return to their rest position without contacting the inking roller 106. Again as in the embodiment of Fig. 3 the inking roller can be removed either laterally as indicated by the arrow B or axially as in the embodiment illustrated in Fig. 2. As will be apparent the print head is pivotal both about the pivot 100 and about the pivot 29.

The use of a floating, rotary inking roller enables larger tolerances without the resultant penalty of poor print quality often associated with stamp impression applicators and the rotary inking roller ensures that even when the applicator is used at high speed, for example when bench mounted and power-operated, the inking will always be adequate since the same surface of the roller is not presented successively to the operative print facets.

CLAIMS

1. Apparatus for printing and dispensing labels comprising a print-head assembly (20,22) having operative print facets, characterised by pivotal lever means (28) mounting the said assembly, means (24,26) pivotally mounting the print-head assembly on the pivotal lever means (28), means (14) for actuating the lever means to bring the assembly to a printing station, and cam means (42,44), including a rotary inking roller assembly (62,64), operative to control pivotal and linear motion of the print-head assembly over at least a part of the operating cycle of the apparatus while the pivotal lever means (28) carry the print head assembly over an arcuate path centred on the pivot point of the lever means (28).

2. Apparatus according to Claim 1 characterised in that the rotary inking roller (62,64) of the inking roller assembly is rotatably mounted but is fixed in relation to the apparatus as a whole.

3. Apparatus according to Claim 1 or Claim 2 characterised in that the means (24,26) pivotally mounting the or each print-head assembly (20,22) is off-set in relation to the longitudinal median line of the print-head.

4. Apparatus according to any one of Claims 1 to 3 characterised in that the inking roller assembly includes an inking roller (62) and a spindle (70,74) mounting the roller, the roller being a free, floating fit on the spindle.

5. Apparatus according to Claim 1, characterised by means (122) biasing the lever means (28) to a rest position, the cam means (42,44) being inoperative to

control the motion of the print-head assembly during the second part of the operating cycle.

6. Apparatus according to any one of Claims 1 to 5 characterised by means (70,72,76) mounting the inking roller assembly in the apparatus so that it is removable in the direction of its rotational axis.

7. Apparatus according to any one of Claims 1 to 6 characterised in that the print-head assembly comprises a print-head including two end plates (80) and the inking roller assembly (62) comprises two end flanges (82), the end plates and the end flanges being so arranged that during the inking part of the operational cycle contact of the end plates and the flanges serves to control the pressure with which the operating print facets (34) contact the roller (62).

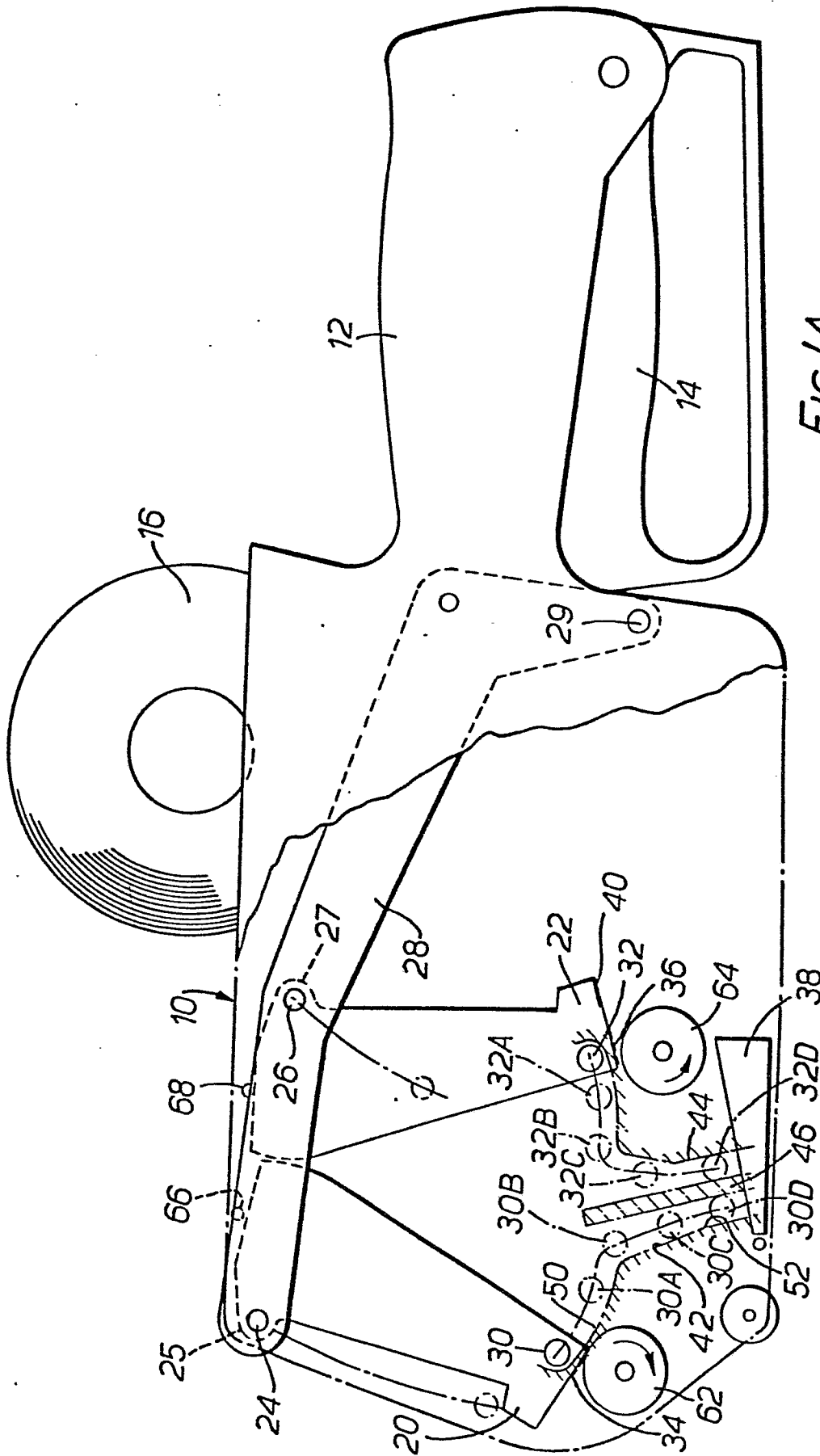


FIG. 1A.

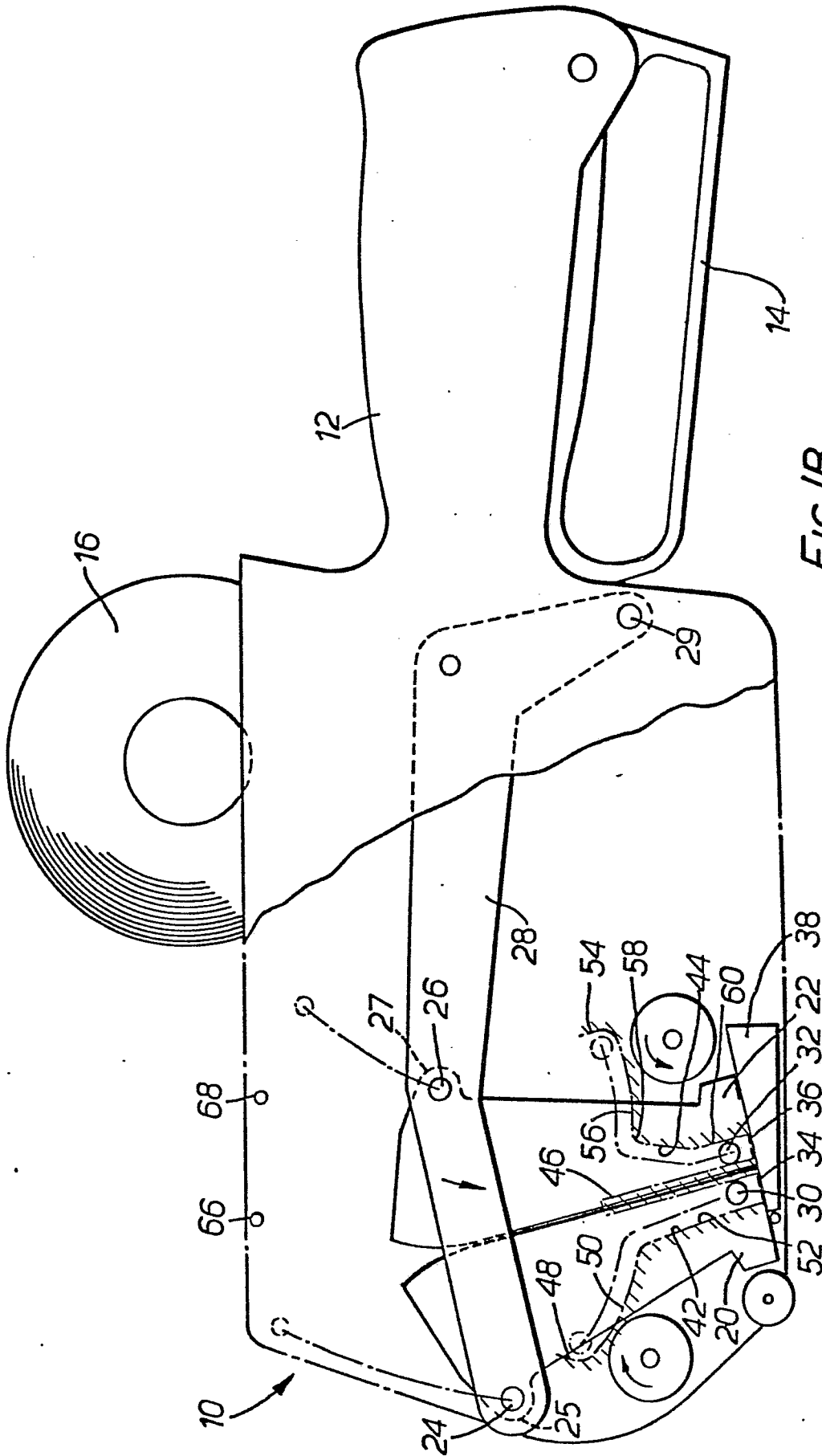


FIG. 1B.

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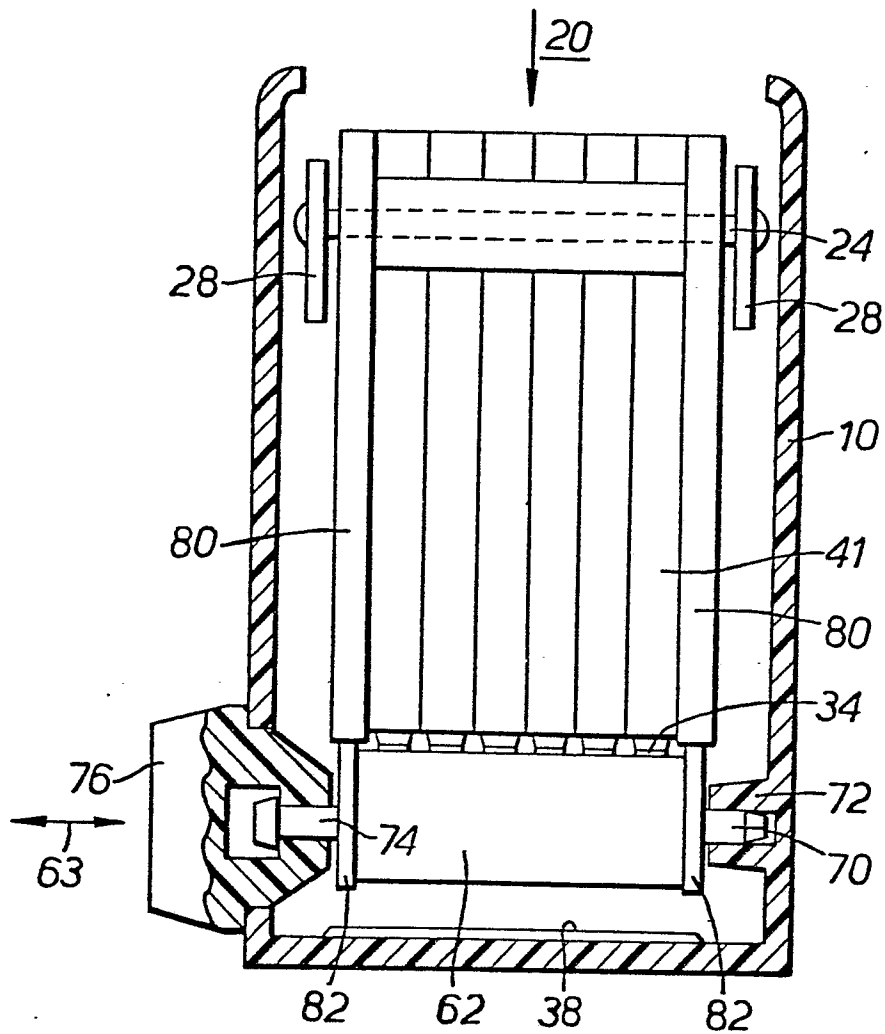
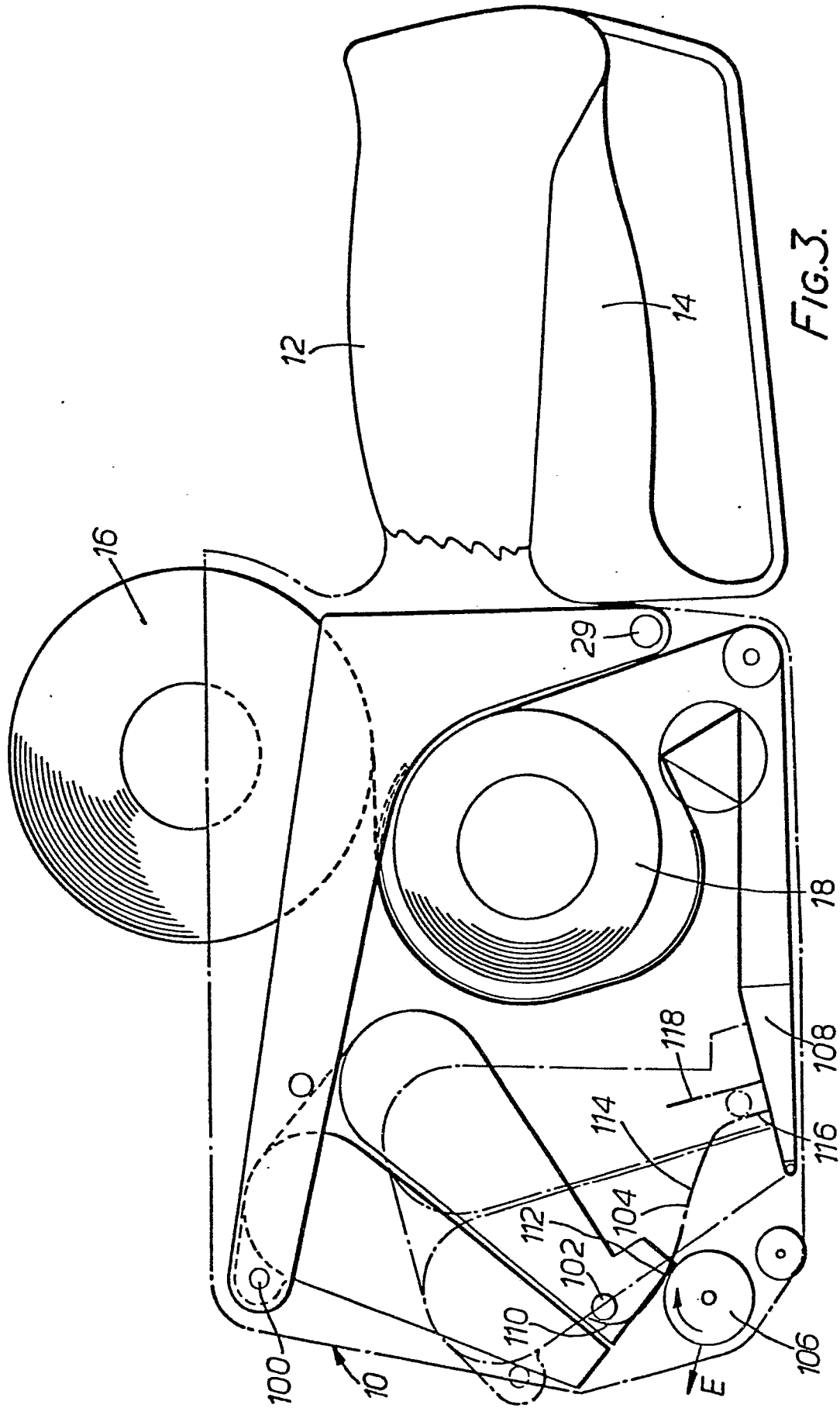
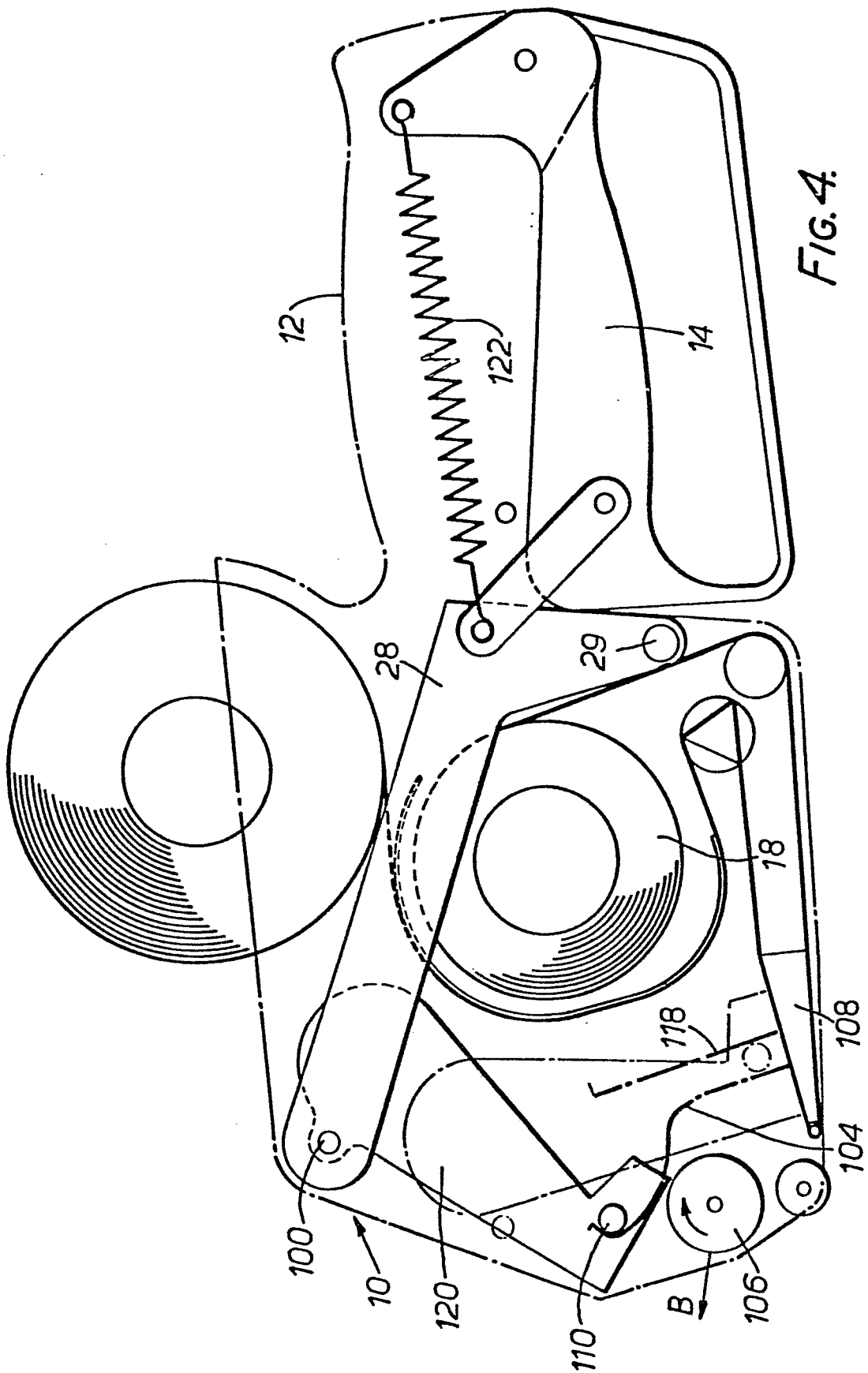


FIG.2.







European Patent
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EUROPEAN SEARCH REPORT

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Application number
EP 81 10 8790

DOCUMENTS CONSIDERED TO BE RELEVANT			CLASSIFICATION OF THE APPLICATION (Int. Cl. ³)
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	
	<u>FR - A - 1 350 395 (TIOX)</u> * Page 2, column 1, line 41 - page 3, line 38; figures 1,2 * -----	1,2,5	B 65 C 11/02
			TECHNICAL FIELDS SEARCHED (Int. Cl. ³)
			B 65 C B 41 K B 41 F
			CATEGORY OF CITED DOCUMENTS
			X: particularly relevant A: technological background O: non-written disclosure P: intermediate document T: theory or principle underlying the invention E: conflicting application D: document cited in the application L: citation for other reasons
			&: member of the same patent family, corresponding document
☒ The present search report has been drawn up for all claims			
Place of search The Hague	Date of completion of the search 30-12-1981	Examiner VROMMAN	